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Emission Laboratory Correlation Study Between EPA and Honda Motor Company, Inc.

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Emission Laboratory Correlation Study Between EPA and Honda Motor Company, Inc.

by

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ABSTRACT

This report presents the results of a laboratory correlation study between EPA and the Honda Motor Company, Inc. It specifically compares Honda's certification test site at its Suzuka laboratory to EPA's certification test site #6.

In general, the test sites compared in this study showed a high degree of equivalency. No significant differences were discovered in dynamometer or CVS characteristics, and vehicle emission test results correlated rather well. The only significant discrepancy was laboratory measurement of vehicle CO emissions, which could have been the result of laboratory barometric pressure differences. Vehicle variability made an accurate assessment of this effect very difficult.

Emission Laboratory Correlation Study Between EPA and Honda Motor Company, Inc.

Introduction:

The goals of a laboratory correlation program are inherently two-fold: to identify differences in equipment, techniques, and procedures, and to relate the effect of these differences to emission levels of various motor vehicles. In this program, emphasis was placed on evaluating the effects of laboratory differences on vehicle emissions rather than isolating the differences. This report will discuss probable differences between EPA's certification test site #6 and a test site of the Honda Motor Company, Inc., and explore the effect of these differences on the emission levels of several Honda vehicles.

Purpose:

It is the intent of this report to present the findings of the correlation study between EPA and Honda and to derive from those findings conclusions regarding the usage of production vehicles as correlation tools.

Test Vehicles and Equipment:

During this correlation study, four Honda vehicles were tested at EPA. All were front wheel drive vehicles equipped with four-cylinder engines, and all were tested in the 2000 pound inertia class. Data of these vehicles are tabulated below:

V.I.D.	657LF-1009	657LF-1004	SBA-2112073	SB-1000249
Model	Civic CVCC	Civic CVCC	Civic	Civic CVCC
C.I.D.	90.8	90.8	75.5	90.8
Transmission	4-speed	4-speed	4-speed	2-speed
System	Engine Modification	Engine Modification	Air Injection	Engine Modification
Standard	Federal Statutory	California Interim	Federal Interim	California Interim

The model Civic CVCC vehicle employs Honda's stratified-charge engine.

Other equipment used in this study included nine calibration gas cylinders, a Honda critical-flow orifice for CVS calibration, timing deivces to measure dynamometer characteristics, and appropriate transducers to measure vehicle speed, manifold vacuum, and temperatures.

Sequence of Correlation Testing:

All vehicles tested at EPA in this program were previously tested at Honda's Suzuka laboratory in Japan. The calibration gases provided by Honda were not analyzed in Japan prior to EPA's analysis.

Test Procedures:

Emission Tests - All vehicles involved in this correlation study underwent the same types of emission tests. These tests may be categorized as three types: (a) 1975 certification tests, without evaporative measurements, (b) steady-state dilute exhaust samples, and (c) steady-state raw exhaust samples. In conducting the 1975 certification tests, the Federal Test Procedure was modified to eliminate unnecessary procedures. Each vehicle was preconditioned before its first test, but not before subsequent tests. No evaporative measurements were taken on any vehicle, but before each test, the vehicle's fuel was heated from 60°F to 84°F as specified in the evaporative section of the Federal Test Procedure. Each vehicle underwent three valid 1975 tests, the second of which was driven by a Honda technician. The Honda driver was used in an attempt to identify the effect of driver differences on vehicle emissions.

The steady-state dilute samples were obtained from each vehicle at constant speeds of 50, 30, and 10 mph. The vehicle was warmed on the dynamometer and then run at each steady state speed for five minutes. A separate set of collection bags was deployed for each steady-state speed, and these bags were analyzed by EPA following normal certification procedures. All of these tests were driven by the Honda driver.

The steady-state raw samples were obtained from each vehicle at speeds of 60, 50, 40, 30, 20, 10, and idle. A sample probe was placed directly in the vehicles exhaust and the emission levels were measured by Honda technicians. These tests were also driven by the Honda driver.

Calibration Gas Check - The calibration gases provided by Honda were analyzed at EPA on certification train #1.

Dynamometer Check - Honda technicians obtained characteristics of EPA dynamometer #6 by running a series of coast-downs and accelerations at the 2000 pound inertia weight. Coast-downs were run both with the vehicle on and off the dynamometer rolls. Accelerations were run, using a 4-speed Honda Civic CVCC, from 30 to 50 mph in 4th gear and 20 to 40 mph in 3rd gear. Both accelerations were at wide open throttle.

CVS Check - With the aid of EPA technicians, Honda engineers conducted a check of EPA's CVS units #1. A Honda critical-flow orifice was used to calibrate the flow rate of the CVS system.

Data Sources:

All data presented in this report were generated at EPA test site #6 or at Honda's Suzuka laboratory. Data relating to the dynamometer check were generated and analyzed by Honda engineers.

Analysis of Data:

Emission Tests - Two types of emission tests will be used to compare EPA and Honda test sites - 1975 certification tests and steady-state dilute sample tests. Data of these tests may be found in Appendix I.

The four vehicles used in this laboratory correlation produced greatly different data comparisons, but some general trends can be seen. Using average certification test emissions of the vehicles at the two laboratories, NOx and CO2 values appear to be equivalent. The maximum NOx discrepancies occurred on the last two vehicles tested, with Honda's lab reporting a 13% lower value than EPA on vehicle SB-1000249, but a 13% higher value on vehicle SBA-2112073. CO2 levels were higher at Honda's facility than at EPA on three vehicles (maximum 6%), but vehicle 667LF-1004 showed a 10% lower CO2 value at Honda.

More consistent certification test emission differences were seen between laboratories in CO and HC measurements. Average levels of the four vehicles tested showed Honda's CO values to be 10-31% lower than EPA's, and Honda's HC values to be 27%, 24%, and 19% lower and 1% higher on the respective vehicles. The vehicle with only 1% HC difference between laboratories was the CVCC model designed to meet the 1975 Federal statutory standards.

The steady-state emission tests tended to show very small differences in emission levels of the two laboratories. CO2 levels at Honda's laboratory were consistently lower than at EPA's, especially at the 10 mph speed (4-20% lower). Differences in other emittants were not consistent as speeds and vehicles varied.

Calibration Gases - Because the calibration gas cylinders were analyzed at EPA prior to analysis in Honda's laboratory, no data comparison is available at this time. Results of EPA's analysis are tabulated in Appendix II.

Dynamometer Checks - The dynamometer coast-down data acquired by Honda was used to derive a comparison with their dynamometer in

Japan. (See Appendix III) EPA's dynamometer #6 was characterized as absorbing greater horsepower over the entire speed range, with a maximum difference of approximately 0.9 horsepower at 40 mph.

Discussion:

Because of the design of this correlation study, an accurate assessment of the effects of test site differences is not easy to make. No data are available which would compare the effects of analysis system differences, and the use of four vehicles increases the variability which an analysis must consider.

Some differences between test sites can be isolated, but their effects can only be approximated, at best. Dynamometer tests revealed that EPA's dynamometer #6 exerted a slightly greater load than Honda's test dynamometer, but that added loading did not seem to affect CO_2 or NO_x levels significantly. Data acquired by Honda technicians in their CVS check are not available for this report, but their analysis indicated no significant differences would be experienced because of variations in the CVS systems. Another possible difference, that of driver characteristics, was not experienced in a comparison of tests driven by EPA and Honda drivers. One difference which is very obvious is the test site barometric pressure, but the effect of this difference could vary between vehicles, making its isolation quite difficult.

Using the vehicle emission tests as comparators, Honda's laboratory produced significantly lower CO and slightly lower HC levels than EPA's laboratory. Twice during testing, vehicle problems caused unusually high HC values. The first test on vehicle SBA-2112073 produced high HC because an engine vacuum line was leaking. The problem was found by Honda technicians and corrected. Vehicle SG-1000249 made use of a throttle control valve which was sensitive to barometric pressure, and that valve was adjusted prior to the final test on that vehicle. Reasons for the trend toward lower HC and CO at Honda's laboratory are not clear, but the effect of barometric pressure may be the main cause of the discrepancy.

As has been the case in previous EPA correlation programs, vehicle variability poses the major problem in judging test site equivalency. If one looks at the most repeatable vehicles used in this study, CO discrepancies seem to be the only problem. Vehicle #657LF-1004 was most repeatable on HC, CO and NO_x, and Honda's discrepancies with EPA's average values on that vehicle were only 1%, 10%, and 3.4% respectively. The most repeatable CO_2 vehicle, #657LF-1009, showed only a 2% difference in average CO_2 levels. Other vehicles showed larger deviations, but they also exhibited less operational consistency. Unfortunately, one cannot rely on vehicles to isolate test site differences, but, in this study, vehicles were used in an attempt to reach that end.

Conclusions:

Results of this correlation study indicate a high degree of equivalency between Honda's test site and EPA's site #6. The only major discrepancy observed was Honda's tendency to produce lower CO emission levels than EPA. The large difference in barometric pressure between the two facilities may be a major contributor to that discrepancy, but the variability between test vehicles and the small number of tests on each vehicle make an accurate estimation of this barometric effect impossible.

Summary and Recommendations:

Results of the laboratory correlation study between EPA and Honda Motor Company, Inc. have been presented and discussed. In general, there was a very good correlation between the test sites of the facilities involved.

In future correlation studies, programs should be designed to use vehicle emission tests as a final check of site equivalency. Prior to any vehicle tests, both EPA and the manufacturer should quantify differences relating to CVS, dynamometers, and analyzers. In this program, there was no confidence that the laboratories' equipment was equivalent before vehicles were tested. Unless this confidence is established before vehicles are tested, emissions tests will not be helpful in isolating the effects of test site differences.

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APPENDIX 1

Emission Test Data

Section	Vehicle
1A	657LF-1009
1B	657LF-1004
1C	GBA-2112073
1D	SG-1000249

Section IA
Vehicle 657LP-1009
Federal Statutory Standard

HONDA CORRELATION DATA (LA 4)

Vehicle Civic 6EVLF-1889 Standard Statutory

	Test Lab.	HC	CO	NO_x	CO_2	Fuel Consumption (mpg)	Barometric Pressure (in. Hg)	K-Factor
Cold Transient (g)	EPA	3.04	21.83	5.82	1257.91	24.3		
	Suzuka	2.73	16.39	6.46	1306			
Cold Stabilized (g)	EPA	0.92	11.27	4.16	1508.49	22.7		
	Suzuka	0.48	9.62	4.51	1516			
Hot Transient (g)	EPA	1.59	12.32	5.76	1164.75	26.8		
	Suzuka	1.56	8.64	6.48	1203			
Total (g/mile)	EPA	0.42	3.69	1.33	362.35	24.4	29.98	0.8967
	Suzuka	0.39	2.88	1.46	368		30.19	

Vehicle Correlation Data (SAE)

Vehicle Civic CVCC 1500F-1989 Test Lab. EPA

	Test No.	HC	CO	NO_x	CO_2	Fuel Consumption (mpg)	Barometric Pressure (in. Hg)	K-Factor
Cold Transient (g)	1	2.68	19.58	5.63	1286.37	28.4		
	2	3.55	26.67	5.[illegible]	1293.11	28.4		
	3	2.59	19.72	6.28	1284.26	28.8		
Cold Stabilized (g)	1	0.91	11.38	4.88	1332.27	27.6		
	2	1.02	13.65	3.96	1488.24	27.9		
	3	0.92	8.83	4.42	1329.85	27.5		
Hot Transient (g)	1	1.46	10.35	5.79	1173.28	26.7		
	2	1.77	15.28	5.58	1282.55	26.7		
	3	1.51	11.56	5.38	1158.58	27.8		
Total (grams/mile)	1	0.385	3.36	1.37	303.42	28.4	29.79	0.8774
	2	0.475	4.52	1.37	308.63	28.5	30.00	0.9505
	3	0.392	3.19	1.48	304.88	28.3	29.89	0.9237

[redacted]

Vehicle Civic CVCC 1500F-1989 Test Lab. Scania

	Test No.	HC	CO	NO_x	CO_2	Fuel Consumption (l/100 km)	Barometric Pressure (in. Hg)	Lambda
Cold Transient (g)	1	2.65	14.58	6.85	1324			
	2	2.52	15.25	6.46	1305			
	3	3.03	16.55	6.98	1289			
Cold Stabilized (g)	1	0.44	9.38	4.60	1573			
	2	0.51	9.57	4.54	1581			
	3	0.54	9.80	4.40	1527			
Hot Transient (g)	1	1.38	7.73	6.29	1387			
	2	1.80	8.65	6.49	1385			
	3	1.79	9.55	6.65	1358			
Total (g/mile)	1	0.79	2.77	1.42	388		30.36	
	2	0.85	2.88	1.47	387		30.32	
	3	0.97	2.92	1.44	389		30.29	

[redacted] CORRELATION DATA (GRAMS/MILE)

Vehicle Civic 67-1000 Standard Statutory

	Test Lab	HC	CO	NO_x	CO_2	Fuel Consumption (mpg)	Barometric Pressure (in. Hg)	K-Factor
50 mph (g/mile)	EPA	0.01	0.50	1.34	256.99	34.4	29.12	0.9897
	Scaqa	0.007	0.60	1.46	265.6			
30 mph (g/mile)	EPA	0.01	0.56	0.60	257.35	34.4	29.12	0.9897
	Scaqa	0.004	0.66	0.56	269.2			
10 mph (g/mile)	EPA	0.16	2.55	0.57	538.59	16.3	29.12	0.9897
	Scaqa	0.05	2.76	0.48	558.8			

Section IB
Vehicle 657LP-1004
California Interim Standard

HONDA CORRELATION DATA (LA 4)

Vehicle Civic 6572-1000 Standard Interim California

	Test Lab.	HC	CO	NO_x	CO_2	Fuel Consumption (mi/g)	Barometric Pressure (in. Hg)	K-Factor
Cold Transient (g)	EPA	4.93	31.28	6.24	1172.92	25.7		
	Scuola	5.39	28.43	5.87	1065			
Cold Stabilized (g)	EPA	2.60	20.56	4.78	1346.77	25.0		
	Scuola	2.65	19.38	4.65	1308			
Hot Transient (g)	EPA	2.16	16.69	6.27	1656.73	26.2		
	Scuola	2.03	13.84	6.15	972	-		
Total (g/mile)	EPA	0.709	5.00	1.47	327.84	25.5	29.00	0.8857
	Scuola	0.80	5.20	1.45	295		30.15	

[illegible] Dynamometer Data

Vehicle [illegible] Test ID. [illegible]

	Test No.	HC	CO	NO_x	CO_2	Fuel Consumption (mpg)	Barometric Pressure (in. Hg)	K-Factor
Cold Transient (g)	1	4.83	31.42	5.95	1179.62	25.6		
	2	4.83	33.16	6.43	1198.31	25.2		
	3	5.14	29.27	6.34	1179.83	25.4		
Cold Stabilized (g)	1	2.47	21.48	4.88	1313.35	24.5		
	2	2.77	20.55	4.54	1288.88	25.7		
	3	2.55	19.65	4.91	1256.20	24.9		
Hot Transient (g)	1	1.93	15.87	6.34	1205.56	26.3		
	2	2.05	16.58	6.10	1225.48	25.9		
	3	2.26	16.12	6.52	1264.73	25.0		
Total (g/mile)	1	0.752	5.87	1.45	332.55	25.1	29.56	0.8728
	2	0.805	6.07	1.48	339.22	27.0	29.19	0.8853
	3	0.808	5.92	1.51	335.34	25.4	29.65	0.8687

Honda Correlation Data (LAC)

Vehicle Civic CVCC 4SFI-1488 Test Lab. Suzuka

	Test No.	HC	CO	NO_x	CO_2	Fuel Consumption (km/l)	Barometric Pressure (in. Hg)	K-Factor
Cold Transient (g)	1	5.37	25.42	5.68	1055			
	2	4.68	25.98	5.58	1077			
	3	5.51	29.88	5.82	1071			
Cold Stabilized (g)	1	2.68	18.26	4.66	1281			
	2	2.72	18.66	4.48	1198			
	3	2.63	21.29	4.80	1282			
Hot Transient (g)	1	1.57	13.81	5.88	961			
	2	2.85	12.29	6.07	964			
	3	2.85	13.23	6.51	970			
Total (g/mile)	1	0.81	5.11	1.38	295		30.31	
	2	0.78	4.95	1.39	295		30.05	
	3	0.82	5.54	1.47	295		30.08	

[redacted] CORRELATION DATA (1981 MY)

Vehicle Civic 4DSD-1600 S-number Interim California

	Test Lab	HC	CO	NO_x	CO_2	Fuel Consumption (mpg)	Barometric Pressure (In. Hg)	K-Factor
50 mph (g/mile)	EPA	0.48	2.29	1.61	355.87	40.4	28.98	0.9726
	Sensitec	0.65	2.85	1.59	385.6			
30 mph (g/mile)	EPA	0.39	2.36	0.40	330.47	38.5	28.94	0.9729
	Sensitec	0.68	2.82	0.40	381.6			
10 mph (g/mile)	EPA	0.36	5.86	0.45	486.29	17.9	28.98	0.9728
	Sensitec	0.58	5.34	0.36	530.8			

Section IC
Vehicle SBA-2112073
Federal Interim Standard

[redacted] CORRELATION DATA (EA #)

Vehicle [redacted] Standard [redacted]

	Test Lab.	HC	CO	NO_x	CO_2	Fuel Consumption (mpg)	Barometric Pressure (in. Hg)	K-Factor
Cold Transient (g)	EPA	5.77	54.47	6.48	1138.47	25.5		
	Sacramento	4.55	44.57	7.26	1256			
Cold Stabilized (g)	EPA	7.55	47.22	3.73	1332.59	24.2		
	Sacramento	5.43	36.82	4.23	1382			
Hot Transient (g)	EPA	5.92	35.59	7.15	1081.45	25.6		
	Sacramento	4.91	25.82	8.11	1084			
Total (g/mile)	EPA	1.79	12.1	1.41	336.88	25.5	29.83	0.9852
	Sacramento	1.36	9.37	1.66	335		30.04	

Vehicle Correlation Data (LAT)

Vehicle: Civic SDI-[illegible] 2003 Test Lab. [illegible]

	Test No.	HC	CO	NO_x	CO_2	Fuel Consumption (mpg)	Barometric Pressure (in. Hg)	K-Factor
Cold Transient (g)	1	6.94	54.53	6.52	1198.73	26.2		
	2	4.78	[illegible]	6.37	1184.69	26.3		
	3	5.58	48.72	6.62	1187.80	26.9		
Cold Stabilized (g)	1	8.99	47.90	3.88	1352.69	23.8		
	2	6.84	47.46	3.55	1306.77	24.6		
	3	7.66	46.30	3.76	1328.96	24.3		
Hot Transient (g)	1	7.52	38.27	6.57	1018.54	28.9		
	2	4.87	38.23	6.95	996.95	29.7		
	3	5.36	38.32	7.53	986.87	30.2		
Total (g/mile)	1	2.37	12.4	1.42	301.33	26.1	29.92	0.9972
	2	1.45	12.6	1.36	304.68	26.6	29.48	0.9825
	3	1.75	11.3	1.46	304.72	26.9	29.29	0.9788

Mobile Correlation Data (LA4)

Vehicle: Civic 1500-CVT(CF3) Test Lab.: Seattle

	Test No.	HC	CO	NO_x	CO_2	Fuel Consumption (mpg)	Barometric Pressure (in. Hg)	K-Factor
Cold Transient (g)	1	4.34	41.35	7.85	1209			
	2	5.55	43.86	7.46	1184			
	3	3.77	40.50	6.46	1156			
Cold Stabilized (g)	1	5.28	32.88	4.56	1400			
	2	5.48	30.62	4.70	1385			
	3	5.54	30.85	4.52	1367			
Hot Transient (g)	1	4.43	23.39	8.49	1074			
	2	5.74	24.47	8.59	1061			
	3	5.12	27.19	7.75	1048			
Total (g/mile)	1	1.29	8.42	1.71	238		30.19	
	2	1.44	9.52	1.59	235		30.07	
	3	1.35	10.76	1.50	227		29.86	

[redacted]

Vehicle Civic [redacted] Standard Federal Interim

	Test Lab	HC	CO	NO_x	CO_2	Fuel Consumption (mpg)	Barometric Pressure (In.Hg)	K-Factor
50 mph (g/mile)	EPA	0.47	4.98	2.24	788.37	42.7	28.88	0.9925
	Scholin	0.34	2.92	1.56	333			
30 mph (g/mile)	EPA	0.23	4.71	0.48	345.91	35.2	28.88	0.9925
	Scholin	0.15	4.48	0.46	250			
10 mph (g/mile)	EPA	0.56	13.38	0.42	520.37	16.3	28.88	0.9925
	Scholin	0.48	11.36	0.48	474			

Section IV
Vehicle 86-1000249
California Interim Standard

HONDA CORRELATION DATA (LA 4)

Vehicle Civic SS-1085299 Standard Interim California

	Test Lab.	NMC	CO	NO_x	CO_2	Fuel Consumption (mpg)	Barometric Pressure (in. Hg)	K-Factor
Cold Transient (g)	EPA	4.23	48.39	0.68	1259.28	25.5		
	Scaled	3.23	26.83	7.93	1378			
Cold Stabilized (g)	EPA	2.85	19.68	6.41	1382.48	24.3		
	Scaled	1.36	14.86	5.58	1426			
Hot Transient (g)	EPA	1.98	17.57	6.42	1123.87	27.5		
	Scaled	1.58	13.38	7.22	1258	-		
Total (g/mile)	EPA	0.66	6.29	1.99	344.35	25.8	28.84	0.9801
	Scaled	0.48	4.32	1.74	363		30.00	

Honda Correlation Data (LAB)

Vehicle Civic SI-1600DX Test Lab. EPA

	Test No.	HC	CO	NO_x	CO_2	Fuel Consumption (mpg)	Barometric Pressure (in. Hg)	K-Factor
Cold Transient (g)	1	4.98	44.47	8.55	1244.56	23.9		
	2	4.12	38.74	8.19	1254.92	24.0		
	3	3.65	37.55	9.33	1335.54	22.7		
Cold Stabilized (g)	1	2.08	21.31	6.58	1388.29	24.1		
	2	2.06	19.50	5.67	1361.74	24.6		
	3	1.89	18.11	6.78	1407.17	23.9		
Hot Transient (g)	1	1.89	18.88	8.77	1137.99	27.2		
	2	1.98	19.92	7.80	1119.39	27.5		
	3	1.92	14.79	8.75	1114.25	27.9		
Total (grams)	1	0.70	6.8	2.03	344.35	25.0	28.83	0.9795
	2	0.661	6.36	1.85	338.56	25.3	28.50	0.9924
	3	0.61	5.7	2.10	355.21	24.6	29.19	0.9465

Vehicle Chevy Van 3500 CID

Test Lab. Scuda

	Test No.	HC	CO	NO_x	CO_2	Fuel Consumption (mpg)	Barometric Pressure (in. Hg)	K-Factor
Cold Transient (g)	1	3.25	25.33	7.69	1358			
	2	3.55	31.19	7.52	1387			
	3	2.91	30.52	8.35	1374			
Cold Stabilized (g)	1	1.38	13.86	5.56	1428			
	2	1.38	14.14	5.44	1434			
	3	1.39	14.17	5.63	1416			
Hot Transient (g)	1	1.37	9.76	7.62	1216			
	2	1.55	10.77	7.17	1253			
	3	1.59	10.37	7.46	1221			
Total (g/mile)	1	0.47	4.04	1.72	352		30.32	
	2	0.51	4.49	1.70	366		30.14	
	3	0.47	4.43	1.79	361		29.87	

[illegible] CORRELATION DATA (1981/1982)

Vehicle Civic SI-1982/83 Standard Interim California

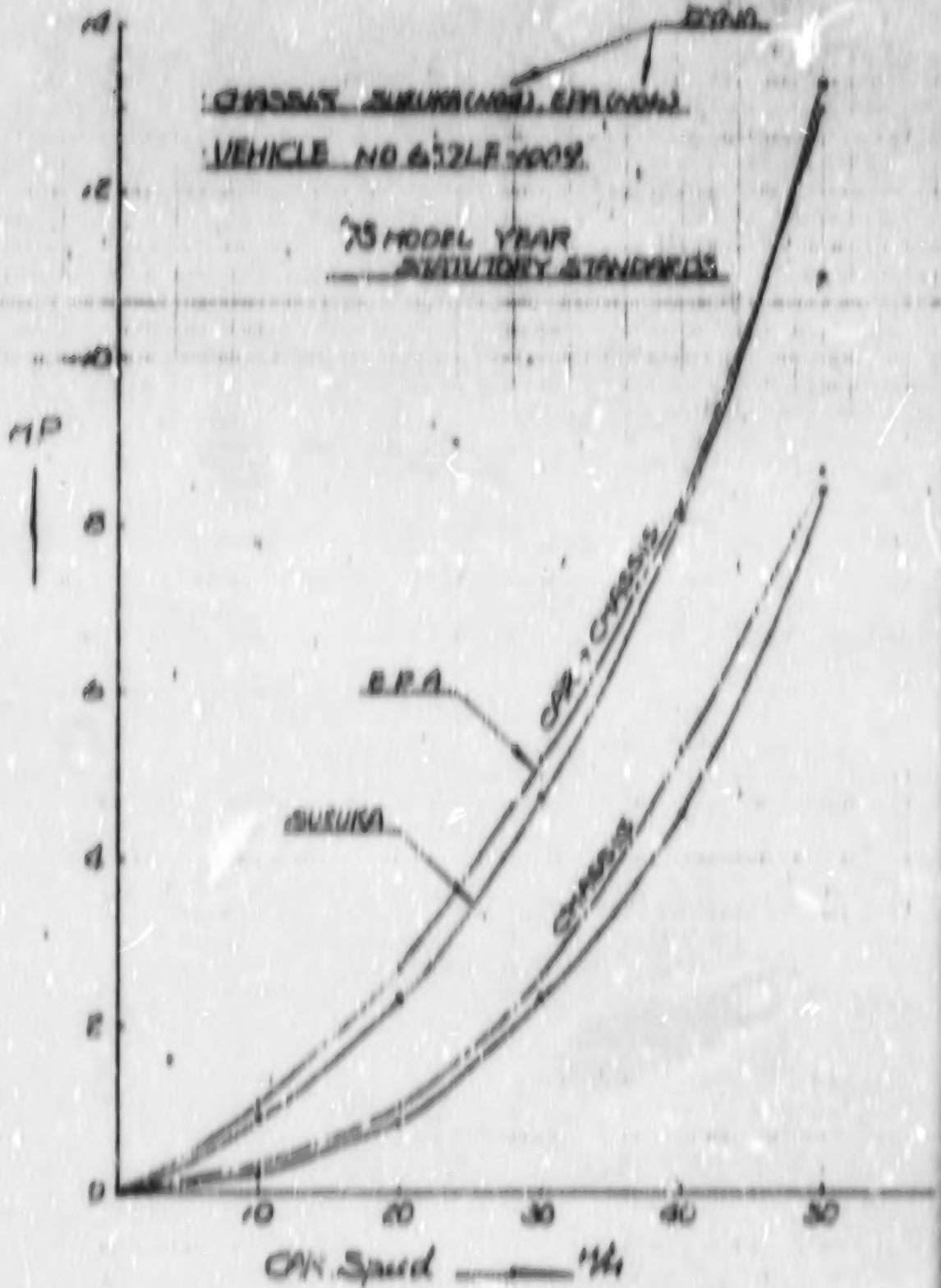
	Test Lab	HC	CO	NO_x	CO_2	Fuel Consumption (mpg)	Barometric Pressure (In.Hg)	K-Factor
50 mph (g/mile)	EPA	0.01	0.57	1.03	242.16	36.5	28.60	0.9255
	Scaled	0.01	0.67	1.37	259			
30 mph (g/mile)	EPA	0.02	1.32	0.68	258.94	41.6	28.60	0.9255
	Scaled	0.04	0.96	0.56	254			
10 mph (g/mile)	EPA	0.57	3.03	0.47	338.11	26.5	28.60	0.9255
	Scaled	0.58	3.35	0.59	2.58			

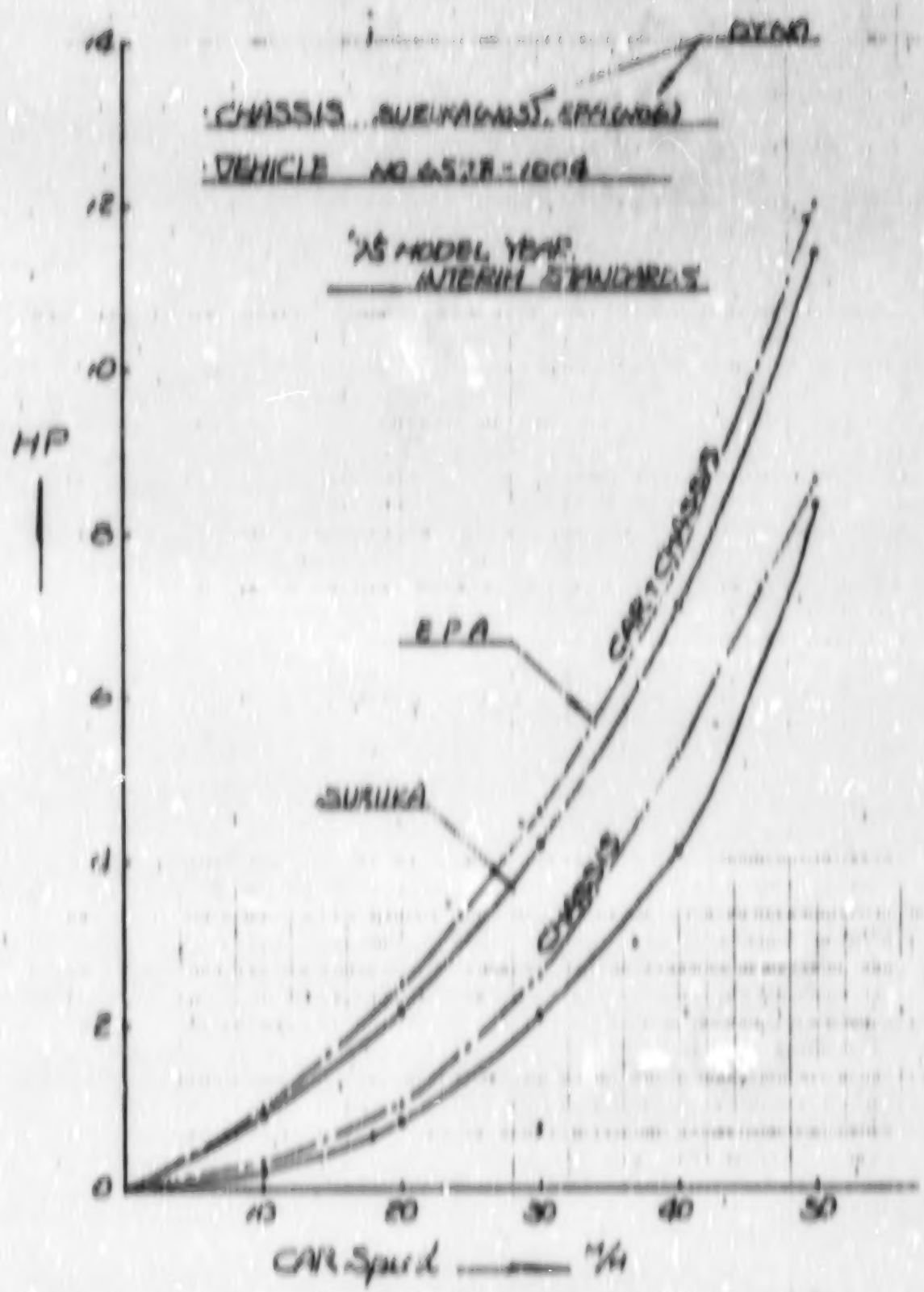
APPENDIX II
Calibration Gas Data

Honda Calibration Gases

Gas	Cylinder No.	Scott Laboratory	EPA	Honda	
C_3H_8 in air (ppm)	C-4552	7.31	7.2		
	C-4509	22.46	22.6		
	C-4599	27.62	27.7		
C_3H_8 in N_2 (ppm)	C-4546	44.15	43.9		
CO in N_2 (ppm)	C-674	70.2	68.2		
	C-690	222	215.4		
CO_2 in N_2 (%)	C-1260	0.93	0.919		
NO in N_2 (ppm)	C-192	24.1	23.0		
NO_x in N_2 (ppm)		24.4	23.3		
NO in N_2 (ppm)	C-1288	46.0	43.2		
NO_x in N_2 (ppm)		46.5	44.2		
EPA Analysis - Train 21					

APPENDIX III
Dynamometer Data


VEHICLE NO 6 52LF 9000 lbs.
'73 MODEL YEAR
STATUTORY STANDARDS
E.P.A.
SUZUKI
CHRYSLER
MPH
0
10
20
30
40
50
CAR Speed — MPH


CHASSIS : SUBARU (GLASS EPOXY BODY)
VEHICLE NO 65 JR - 100 4
'85 MODEL YEAR
INTERIM STANDARDS
EPA
SUBARU
CHASSIS
HP
0
2
4
6
8
10
12
14
20
30
40
50
CAR Speed — M/H